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The invention relates to a throat side implant.

With the obstructive Schlafapnoesyndrom, in the following like also in the technical literature short OSAS mentioned, arise to repeating breathing spaces, in which a muscular relaxation appears and as sequence of it dropping back in particular the tongue body due to the gravity in the deep sleep phases and rem sleep phases (REM = rapid EyeMovement). The tongue body sets itself then in the extreme case on the throat back plate and locks thereby the airway in this region. Furthermore also a collapse of the throat side panels can contribute to the closure of the respiratory system.

The thereby caused breathing spaces end only then if by the Sauerstoffentsättigung of the blood and the oxygen deficiency in the brain sudden waking made up, until a flatter sleep stage or complete arousing becomes achieved, whereby the muscular basic tension increases again so far that the tongue body withdraws itself from the throat back plate and/or. the throat side panels again harness themselves and the breath way open. Afterwards the sleep-slow flows again into MORE MORE REM or deeper sleep phase, until the described above pre course begins again.

The OSAS is in need of treatment, because by the repeating Sauerstoffentsättigungen of the blood regular during sleeping heart muscle damage, heart wreath/ring container illnesses, cerebral vessel illnesses with amassment of impact accumulation and reduction of brain as well as blood high pressure crises and a variety of hormoneal disturbances can occur. Besides leads frequent being missing of the deep sleep phases, which disturbance of the rem sleep phases and frequent arousing to Antriebslosigkeit, daily tiredness and easy falling asleep inclination during the day, which can lead when serving machines or with driving a car to accidents.

It is known to treat that OSAS by producing a constant overpressure in the nasopharyngeal cavity by means of an extracorporeal compressor during the sleep over a tube and a nose mask. A such treatment with overpressure can in the long term to extensions of the alveoli and to shortening of the alveolus intermediate walls, the so called Lungenemphysem, leads and as sequence of it to a reduction of the entire lung diffusion area and to difficulty in breathing. In addition the disadvantage that with a lung positive pressure the pump power of the right ventricle must increase exists, in order to be able to press the equal amount blood against the increased backpressure into the lung. This can lead to muscle illnesses of the right heart. An other disadvantage consists of the fact that that is supports of a masque during the sleep disturbing.

By the book of L. Grothe, H. Cutters “Schlafapnoe and cardiovascular diseases”, Thieme 1996, are oral prostheses known, which are to be begun before falling asleep into the throat and which have purpose to press the tongue reason forward. In addition such oral prostheses are promising however only with leichtgradigen developments of the OSAS and become because of the complicated handling and the inconveniences only from a small percentage of the patients tolerated.

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To the treatment of the OSAS also surgical therapys measure are known, which essentially exist in an improvement of the air passage in the nose and nose throat region. It is even also attempted to before-shift under and Oberkiefer or a sawn out mandible square in the Kinnbereich also adherent tongue muscles in order to improve so the air passage. This is a large operative engagement, which represents a considerable load for the patient and beyond that rare acceptable results supplies with, there it, exactly the same as the surgical therapys measure described before, only indirect treated, because dropping back of the tongue body and its application do not become causally avoided to the throat back plate and the closure of the breath way connected thereby.

In the unpublished German patent application with the official file reference 197 56 956 is essentially an implant to the implantation into a tongue described, which an attachment part exhibits to the attachment at the tongue leg or at the lateral tissue lain by the tongue as well as a support part, itself from the attachment part into the region of the tongue reason and transverse to the direction of the tongue extended.

The invention is the basis the object to indicate a throat side implant by which the OSAS effective avoided or reduced will and impairments of the patient become to a large extent avoided such as swallowing difficulties and disturbances during the sleep, in particular if the tongue basic implant in accordance with the German patent application 197 56 956 to the treatment of the OSAS not be sufficient should not.

Those the invention at the basis located object becomes dissolved by the teaching indicated in the claim 1.

The principle of this teaching consists of creating a throat side implant which is so more implantable that in each case an end of the implant is neck-eddy-laterally and the other end tongue-sideedge-laterally disposed. The throat side implant according to invention is favourably more insertable if the supporting effect of the mentioned above tongue basic implant is not sufficient and a tongue basic implant reinforcement or a tongue basic implant change is not to become from several reasons made. A possible reason for this would be that a too large impairment of the tongue basic mobility is feared or that the tongue basic implant so good enter-hurried that an other operative manipulation within the implant range lets a too strong scar formation or differently a conditional deterioration of the operation result fear. The main effect of the throat side implant according to invention would be into this cases the support of the edge of tongue; a side effect would be the support of the lateral throat fabric. The throat side implant according to invention is favourably more insertable, even if a substantial other cause for the OSAS in the collapse of the lateral throat walls becomes seen.

The main effect of the throat side implant would be into this cases supporting the lateral throat fabric, whereby as side effect still the support of the edge of tongue is added. By the throat side implant according to invention the lateral edge of tongue can become strong supported as with sole use of a tongue basic implant, without the entire supporting force effect becomes crosswise transfered over the tongue reason, these thus despite stronger lateral tongue supporting effect remains more movable than with sole tongue basic implant and the sip procedure less affected becomes, there the Stützkraft in the entire throat cross section and/or over a part of the throat linear dimension better distributed.

Favourably the implant parts of the implants are bent formed, in such a manner that in the implanted state the convex side of the throat inside and/or. the throat mucous membrane directed is. Thereby particularly good supporting effects on the lateral edge of tongue and/or the lateral throat fabric become exerted.

Other favourable and convenient formations of problem solving according to invention are in the other Unteransprüchen indicated.

The invention is to become subsequent on the basis the accompanying drawing, which shows embodiments, more near explained.

It shows

Fig. 1 a cross section by the face head in height of the tongue back with two implant parts implant according to invention and of an inserted,

Fig. 2 an oral cavity from in front with left-sided remote palate and cheek mucous membrane and inserted two-piece implants and

Fig. 3 a lateral Sagittalschnitt by the lower face head (of on the right of opened mouth and nose area by removal of the right under and Oberkiefers) with two implanted implant parts of implants according to invention.

Equal parts in the figs are provided with the same reference numerals.

Into the Fig. 1 to 3 schematic represented anatomical parts are with reference numerals as follows referred: 2 tongue bodies
4 tongue backs
6 hard palate
8 soft palate/palate gel
10 tongue feeling nerve
12 knöcherner outside ear canal
14 large Halsvene
16 large Halsarterie
18 lateral throat musculature
20 tongue movement nerve
22 tongue basic containers
24 tongue leg
26 tongue main containers
28 cheek mucous membrane with cheek muscle
30 outside masseter
32 vertical lower jaw branch
34 inner masseter
36 throat lumens
38 neck eddy bodies
40 lower lip
42 lower cutting teeth
44 front neck spinal column prolonged musculature
70 Pterygoidknochen

The Fig. 1 shows the arrangement of a first implant 1 with a left implant part of 46 and a right implant part of 52. The implant parts of 46, 52 exhibit in each case a front tongue-edge-lateral end 50, 56 and a rear neck-eddy-lateral end 48, 54. The neck-eddy-lateral implant end of 48, 54 can be with the spinal column 38 for example with the help of a screw connected; in addition, there can be spaced to the spinal column disposed and end in the spinal column adjacent tissues, whereby for this implant end a mobility obtained more or less large into all directions remains, whereby the mobility becomes toward the spinal column by these even limited. The mobility in the other directions becomes major limited by the elasticity of the tissue lain between implant end and spinal column, in addition, by restoring forces the remaining implant of the adjacent tissue. The front tongue-sideedge-lateral end 50, 56 of the implant parts can be in the region of the tongue side edge disposed or rest against the tongue side edge or be in the tongue side edge implanted. The two implant parts of 46, 52 are preferably 4 implanted by a slot in the lateral tongue back and extend the rear in each case Gaumenmandel in curved shape up to the neck eddy body 38. The bent implant parts are so disposed with the fact that in the implanted state the convex side of the implant parts of the throat inside and/or. the throat mucous membrane directed is. For instance the center of the implant parts of 46, 52 works as support part for the throat side panel and prevented their collapse to the throat center. The implant parts of 46, 52 of the implant 1 can fulfill thus two functions, to supporting the lateral tongue ranges against dropping back and supporting the throat side panel against a collapse directed to the throat center.

The Fig. the arrangement points 2, which shows the oral cavity from in front with left-sided remote palate and cheek mucous membrane, in connection with the Fig to. 1 described implant 1 as well as the arrangement of an other implant 1 '. Concerning the arrangement and formation of the implant 1 can on the description to the Fig. 1 to be referred.

The other throat side implant 1 ' exhibits likewise two implant parts, a left implant part of 60 and a right implant part of 61. These implant parts of 60, 61 are a preferably bottom angle of approx. 45 DEG to the implant parts of 46, 52 implanted and serve in particular for the support the throat side panel. These implant parts of 60, 61 run from in front above by the front lateral palate gel oblique to the rear down before the lateral spinal column and do not have contact to the tongue. They point in each case a front palate-gel-edge-lateral and/or. throat-side panel-lateral end 72, 74 and a rear neck-eddy-lateral end 76, 78 up and are 1 bent formed, in such a manner like the implant parts of 46, 52 of the implant, that in the implanted state the convex side of the throat inside and/or. the throat mucous membrane directed is. The use of the implant 1 ', thus the implant parts of 60 and 61, has in particular advantages if the throat above the tongue back, thus in the region of the palate elbows, in sleep-collapsed and this region is to become supported. The rear end 76, 78 of the implant parts of 60, 61 of the implant 1 ' is 38 attached at the neck spinal column or supports themselves to it off or is in the lying in front of it tissue attached or supports itself to it off. The front end 72, 74 of the inserted implant parts of 60, 61 is in in the environment of the lateral hard edge of palate rear 6 and/or the Pterygoidknochens 70 of located tissue attached or supports itself to it off.

The Fig. 3 shows the right in each case implant parts of 52 of the implant according to invention 1 and 61 of the implant according to invention 1 ' in the implanted in each case layer, whereby in the drawing is remote to the better illustration the right lateral face with opening of right mouth and right nose.

The implant parts of 46, 52, 60, 61 are essentially strip shaped formed, whereby bottom strip shaped is to become also a flat however thick and various also various at various locations wide structures understood. The longitudinal extent of the implant parts is preferably larger thereby as the implant-thick, whereby the transverse extension can be variable. The implant parts exhibit at least after the implantation a curved shape convex concerning the throat side panel.

The implants 1 and 1 ' can become single and combined with one another or single or together combined with a tongue basic implant inserted, in particular if detected as substantial causes for the OSAS both dropping back of the tongue is and incidences of the throat side panels from the beginning. The choice of the implants depends on which structures substantial in the sleep collapsing.

The lateral throat implants according to invention are preferably very soft formed, in order not to provoke or hurt the substantial structures such as nerves and vessels. They consist of grown, body-own tissue or of plastic or a combination of both materials. In place

of grown, body-own tissues also in another place removed body-own tissues can become used.